

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
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PCT

Bingham McCutchen
IP Docket Dept.

WRITTEN OPINION

(PCT Rule 66)

Date of Mailing (day/month/year) 26 APR 2004	
Applicant's or agent's file reference 595.0033PCT 721033-001-3221000	REPLY DUE within 2 months/days from the above date of mailing
International application No. PCT/US02/26276	International filing date (day/month/year) 15 August 2002 (15.08.2002)
Priority date (day/month/year)	
International Patent Classification (IPC) or both national classification and IPC IPC(7): H01B 3/02, 3/30, 3/46; B32B 3/26; C08G 65/00, 77/04 and US Cl.: 252/570,573; 428/304.4,312.6,447; 521/154,180; 525/390,416,474,534	
Applicant HONEYWELL INTERNATIONAL INC.	

response due: 6/26/04

1. This written opinion is the <u>first</u> (first, etc.) drawn by this International Preliminary Examining Authority.	
2. This opinion contains indications relating to the following items: <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 	
3. The applicant is hereby invited to reply to this opinion. <p>When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).</p> <p>How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.</p> <p>Also For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6</p> <p>If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.</p>	
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: <u>15 December 2004 (15.12.2004)</u>	
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Jeffrey B. Robertson Telephone No. 571-272-1700 <div style="text-align: right; font-size: 0.8em;"> Jean Proctor Paralegal Specialist </div>

I. Basis of the opinion**1. With regard to the elements of the international application:***

- ☒ the international application as originally filed
- ☒ the description:
pages 1-33, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____
- ☒ the claims:
pages 34-37, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____
- ☒ the drawings:
pages 1-10, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

WRITTEN OPINION

International Application No.
PCT/US 276

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>10,22,25,41</u>	YES
	Claims <u>1-9,11-21,23,24,26-40</u>	NO
Inventive Step (IS)	Claims <u>10,22,25,41</u>	YES
	Claims <u>1-9,11-21,23,24,26-40</u>	NO
Industrial Applicability (IA)	Claims <u>1-41</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Please See Continuation Sheet

----- NEW CITATIONS -----

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

V. 2. Citations and Explanations:

Initially it is noted that Hacker (U.S. Patent No. 6,472,076) was indicated an X,P reference. However, it is noted that Hacker was published after the international filing date, and for that reason, it does not qualify as prior art to the present application.

Claims 1-9, 11-21, 23, 24, 26-40 lack novelty under PCT Article 33(2) as being anticipated by Hawker et al. (U.S. Patent No. 6,107,357).

For claims 1 and 28, Hawker teaches novel dielectric materials in column 3, lines 27-30. For claims 1, 4-9, and 35-40, in column 6, line 14 through column 7, line 57, Hawker teaches host polymers including organic compounds such as poly(arylene ethers) (column 6, line 56). For claims 4-6, 9, 35-37, and 40, in column 6, lines 24-51, Hawker teaches siloxanes including hydrogen silsesquioxanes and alkyl silsesquioxanes. In column 8, lines 1-24, Hawker teaches porogens, where the porogen is a polymer comprised of monomer units. Since applicant has claimed a "monomer component", the claim has been interpreted to read on substances that contain monomer units. Hawker discloses that the porogen is coupled to the host polymer.

For claims 2 and 28-32, in column 10, lines 37-49, Hawker teaches that upon heating, the porogen decomposes to volatile fragments that diffuse out of the host matrix, leaving voids behind. For claims 3, 16-21, 23, 24, 26, and 27, in column 10, line 50 through column 11, line 60, Hawker teaches a low dielectric material with a dielectric constant of preferably less than 2.5. Hawker teaches that these materials are used in electronic devices such as integrated circuits. Here, Hawker also discloses that the composition has cell pores (plural, at least two) of preferably less than about 10nm.

For claims 11-15, 33, and 34, in column 4, line 64 through column 5, line 52, Hawker teaches that the term alkyl contains branched and cyclic groups. In column 8, lines 1-21, Hawker teaches that alkyl substituted styrene may be used, which contains an aromatic group. For claim 15, Hawker teaches the use of methyl methacrylate, which has a saturated bond.

Applicant argues that Hawker does not teach all the limitations of the claims. The examiner disagrees. Hawker teaches the limitations of the claims as detailed above.

Claims 1-7, 9, 11-21, 23, 24, 26-38, and 40 lack novelty under PCT Article 33(2) as being anticipated by Zhong (U.S. Patent No. 6,143,360).

For claims 1, 2, 3, 16-19, 28, and 32, in column 3, lines 13-27, Zhong teaches silicone resin compositions that are used to form low dielectric constant films for electronic devices. In column 3, lines 30-66, Zhong teaches that a hydrosilicon resin is contacted with a 1-alkene so that precursor is bonded to the hydrosilicon resin. Here Zhong also teaches that upon heating to a sufficient temperature, thermolysis occurs, where the alkyl substituents are liberated to form a nonporous resin. For claims 4-7, 9, 35-38, and 40, Zhong teaches formulas showing hydrogen siloxanes and organohydrogensiloxanes. For claim 9, the formula $(\text{HSiO}_{1/2})_n$ is a caged structure.

For claims 11, 12, 15, 33, and 34, in column 4, line 57 through column 5, line 6, Zhong teaches that the alkenes are preferably

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

branched alkenes. The alkenes listed have at least one saturated bond.

For claims 20, 21, 23, 24, 26, 27, and 29-31, Zhong teaches in column 6, lines 39-62 that nanoporous films are produced that have dielectric constants preferably less than about 2.5. Here, Zhong also teaches that the pore diameter is in a range of 0.3 to 2 nm.

Applicant argues that Zhong does not teach monomer components. The examiner disagrees. 1-alkenes are known as monomers that form polymers. Applicant also argues that Zhong teaches only 1-alkenes and that applicant teaches other compounds. However, these compounds are not claimed. Zhong teaches the limitations of the claims as detailed above.

Claims 1-3, 7, 8, 14, 16-21, 23, 24, 26-32, 38, and 39 lack novelty under PCT Article 33(2) as being anticipated by Lau et al. (U.S. Patent No. 6,156,812).

For claim 1, in column 3, lines 13-52, Lau teaches nanoporous materials that contain a polymer component (structural component) and thermolabile groups (monomer component). For claims 7 and 38, Lau teaches that the structural precursor is organic. For claims 8 and 39, in column 7, lines 31-34, Lau teaches that the polymer component is poly(arylene ether). In column 7, lines 53-67 through column 8, lines 1-24, Lau teaches thermolabile groups containing connector moieties that bond to the polymer strand. These groups can be aromatic as required in claim 14.

For claims 3, and 16-19, in column 12, lines 14-30, Lau teaches that dielectric materials are formed and used in electronic components such as circuit boards.

For claims 1, 20, 21, 23, 24, in column 11, lines 55 to 67, Lau teaches materials with low dielectric constants in the range of 2.0 to 2.5. For claims 26-31, in column 12, lines 9-16, Lau teaches nanoporous materials that have voids that are about 1 nm in size. For claims 2, 28, and 32, in column 8, lines 25-56, Lau teaches degrading of the thermolabile group through heat.

Applicant argues that the Lau reference should not be considered as prior art because it is commonly owned. However, this is incorrect. The Lau patent was issued on December 5, 2000, which is more than 1 year prior to the filing date of this application. Therefore, ownership of the patent is irrelevant. Applicant also argues that the thermolabile groups are not the size of a monomer or size of a monomer. Applicant is referred to the definition of monomer in the present application on page 8, second full paragraph where monomers may comprise repetitive building blocks and range in weight from 40-20,000 daltons. Lau teaches the limitations of the claims as set forth above.

Claims 1-41 meet the criteria set out in PCT Article 33(4), and thus are industrial applicability because the subject matter claimed can be made or used in industry in low dielectric materials for electronic components.

Claims 10, 22, 25, and 41 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest materials where the structural component is an adamantane based molecule or where the dielectric constant is less than 2.